

TOSHIBA PHOTOINTERRUPTER INFRARED LED + PHOTOTRANSISTOR + AMPLIFIER CIRCUIT

# TLP1211

COPIER, LASER BEAM PRINTER

FACSIMILE, PRINTER

AUTOMATIC VENDING MACHINE, TERMINAL EQUIPMENT  
IN BANKING FACILITIES

PLAYING EQUIPMENT, FA EQUIPMENT

VARIOUS POSITION DETECTION SENSOR

The TLP1211 is a photointerrupter with a connector provided using a GaAs infrared LED at the emitter side and a Si phototransistor and an amplifier circuit at the detector side.

The output becomes high level when the light is shielded.

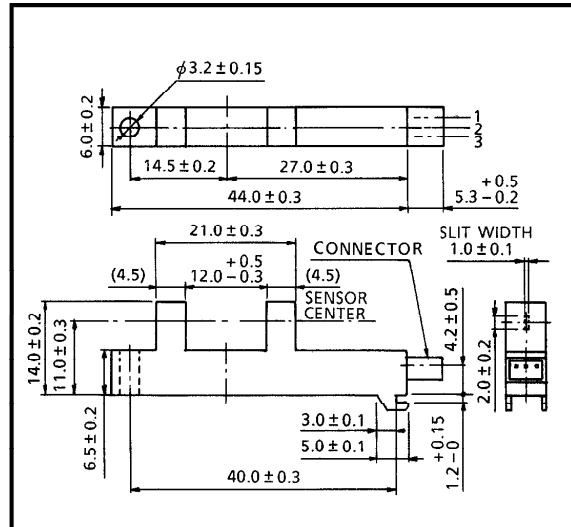
The Gap is as wide as 12mm and this product is usable for detection of large size substances.

- For 5V of power supply voltage
- Open collector output
- Mounting plate thickness : 1.2mm
- Wide gap : 12mm
- Resolution : Slit width 1mm
- Low current consumption :  $I_{CC} = 20\text{mA}$  (Max.)
- Output current :  $I_{OL} = 16\text{mA}$  (Max.)
- Material of the case : Polycarbonate

Connectors  
IL-Y-3P-S15T2-EF

(Japan Aviation Electronics Industry made IL-Y  
Series Connector)

Unit in mm

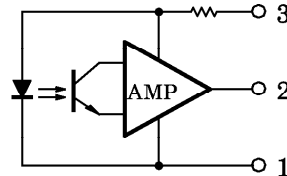


( ) : REFERENCE VALUE

|         |         |
|---------|---------|
| JEDEC   | —       |
| EIAJ    | —       |
| TOSHIBA | 11-21B1 |

Weight : 2.13g (Typ.)

PIN CONNECTION



1. GND
2. OUT
3. VCC

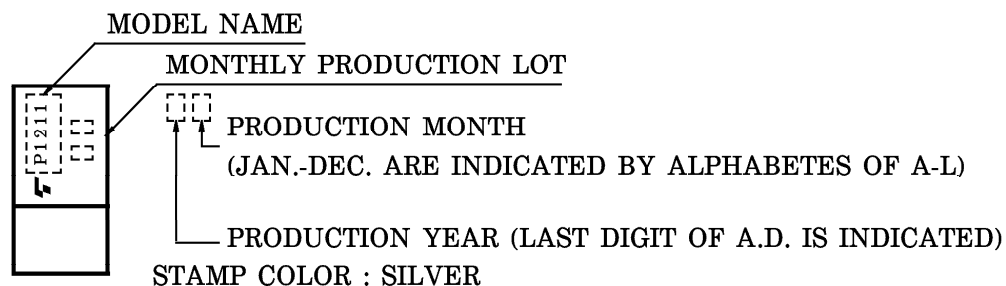
961001EBC2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

## MAXIMUM RATINGS (Ta = 25°C)

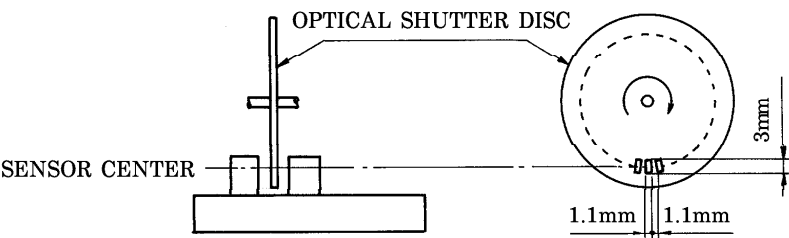
| CHARACTERISTIC                                | SYMBOL                           | RATING | UNIT    |
|---|----------------------------------|--------|---------|
| Supply Voltage                                | V <sub>CC</sub>                  | 6      | V       |
| Output Voltage                                | V <sub>O</sub>                   | 28     | V       |
| Low Level Output Current                      | I <sub>OL</sub>                  | 16     | mA      |
| Low Level Output Current Derating (Ta > 25°C) | $\Delta I_{OL} / ^\circ\text{C}$ | -0.21  | mA / °C |
| Operating Temperature Range                   | T <sub>opr</sub>                 | -25~75 | °C      |
| Storage Temperature Range                     | T <sub>stg</sub>                 | -40~85 | °C      |

## PRODUCT INDICATION

OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C, V<sub>CC</sub> = 5V ± 10%)

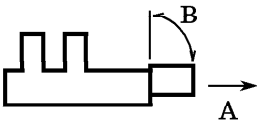
| CHARACTERISTIC              | SYMBOL          | TEST CONDITION   | MIN.                              | TYP.               | MAX. | UNIT |
|-----------------------------|-----------------|------------------|-----------------------------------|--------------------|------|------|
| Supply Voltage              | V <sub>CC</sub> |                  | 4.5                               | 5.0                | 5.5  | V    |
| Supply Current              | High Level      | I <sub>CCH</sub> | Shutter In                        | —                  | —    | mA   |
|                             | Low Level       | I <sub>CCL</sub> | Without Shutter                   | —                  | —    |      |
| Output Voltage              | High Level      | V <sub>OH</sub>  | Shutter In, R <sub>L</sub> = 10kΩ | 0.9V <sub>CC</sub> | —    | V    |
|                             | Low Level       | V <sub>OL</sub>  | Without Shutter                   | —                  | 0.07 |      |
| Peak Emission Wavelength    | λ <sub>p</sub>  | LED Side         | —                                 | 940                | —    | nm   |
| Peak Sensitivity Wavelength | λ <sub>p</sub>  | Detector Side    | —                                 | 870                | —    | nm   |
| Response Frequency          | f               | R = 1.5kΩ (Note) | 1000                              | —                  | —    | Hz   |

(Note) A value measured when the disc shown in the following figure was rotated. No DC current should be output.



TERMINAL STRENGTH (Ta = 25°C)

| CHARACTERISTIC | TEST CONDITION |             | LIMIT                                   |
|----------------|----------------|-------------|---|
| PULL           | DIRECTION      | A           | NO DEFECT OF ELECTRICAL CHARACTERISTICS |
|                | WEIGHT         | 19.6N       |   |
|                | TIME           | 5s / ONCE   |   |
| BEND           | DIRECTION      | B           |   |
|                | WEIGHT         | 9.8N        |   |
|                | TIME           | 5s / THRICE |   |



## PRECAUTION

Please be careful of the followings.

1. Screw shall be tightened to clamping torque of 0.59N·m.
2. When installing, avoid to work by holding the connector by hand. Always, install by holding the main body of the element while assuring the mounting board is not warped or twisted. The connectors shall be inserted or pulled out at normal temperature.
3. It is recommended to mount this product by inserting from the sheet metal pressed side.
4. The container is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol, and aliphatic hydrocarbons however, with peroxochemicals (such as benzene, toluene, and acetone), alkali, aromatic hydrocarbons, or chloric hydrocarbons, polycarbonate becomes cracked, swollen, or melted. Please take care when choosing a packaging material by referencing the table below.

## &lt;Chemicals to avoid with polycarbonate&gt;

|   | PHENOMENON                        | CHEMICALS   |
|---|-----------------------------------|---|
| A | Little deterioration but staining | <ul style="list-style-type: none"> <li>• nitric acid (low concentration), hydrogen peroxide, chlorine</li> </ul>  |
| B | Cracked, crazed, or swollen       | <ul style="list-style-type: none"> <li>• acetic acid (70% or more)</li> <li>• gasoline</li> <li>• methyl ethyl ketone, ethyl acetate, butyl acetate</li> <li>• ethyl methacrylate, ethyl ether, MEK</li> <li>• acetone, m-amino alcohol, carbon tetrachloride</li> <li>• carbon disulfide, trichloroethylene, cresol</li> <li>• thinners, oil of turpentine</li> <li>• triethanolamine, TCP, TBP</li> </ul> |
| C | Melted<br>{ } : Used as solvent.  | <ul style="list-style-type: none"> <li>• concentrated sulfuric acid</li> <li>• benzene</li> <li>• styrene, acrylonitrile, vinyl acetate</li> <li>• ethylenediamine, diethylenediamine</li> <li>• {chloroform, methyl chloride, tetrachloromethane, dioxane, 1, 2-dichloroethane}</li> </ul>   |
| D | Decomposed                        | <ul style="list-style-type: none"> <li>• ammonia water</li> <li>• other alkali</li> </ul>   |

